

THEREFORE I CLAIM

1. A fall restraint system for a ladder system which comprises:
 - a) a platform
 - 5 b) a ladder extending upwardly from said platform:
 - c) a safety cage extending around said ladder and having a cage element located at a first elevation above said platform:
 - 10 d) a guard rail extending at least partly around said platform and having a rail element positioned at an elevation above said platform and below said cage element so that there is an open region located between said rail element and said cage element, said fall restraint system comprising
 - 15 a) a plurality of restraint sections located at spaced locations at said open region, each restraint section comprising:
 - 20 i) an elongate restraint component having first and second end portions and arranged to be positioned between said cage element and said rail element:
 - ii) a rail connecting component arranged to mechanically attach the first end portion of the restraint component to the rail element.
 - 25 iii) a cage connecting component arranged to mechanically attach the second end of the

portion of the restraint component to the cage element.

- 5 b) said restraint component being arranged to be able to
be extended or retracted to enable it to be joined to the
cage element and rail element so that when the rail
element and the cage element are at different positions
relative to one another, the restraint section can be
extended or retracted as needed to made a proper
10 connection to said rail element and said cage element.

2. The restraint system as recited in Claim 1 wherein the
restraint section comprises:

- 15 a) a generally vertical first restraint section having a
substantial vertical alignment component and being
adapted to be connected to said rail element so as to
extend upwardly therefrom;
b) a generally horizontal second restraint section having a
substantial horizontal alignment component and
20 adapted to be connected between an upper
portion of said first restraint portion and to extend to
said cage element and be connected thereto.

3. The restraint system as recited in Claim 2, wherein said first
25 restraint section is arranged to be extendable and retractable
along a first lengthwise axis having a substantial vertical
alignment component.

4. The restraint system as recited in Claim 3, wherein second
restraint section is arranged to be positioned at different
angular positions extending between the first restraint portion
and the cage element.
5. The restraint system as recited in Claim 2, wherein said
generally vertical first restraint section comprises a rail
engaging portion and an adjustable portion a vertically
adjustable upper connecting portion adapted to be
connected to said second restraint section at different
elevations.
6. The restraint system as recited in Claim 5, wherein said
adjustable portion comprises an elongate extension
portion and said rail engaging portion has an upwardly
extending restraint portion, said elongate extension portion
and said upwardly extending restraint portion being arranged
to be adjacent and in alignment with one another so as to be
extendable and retractable relative to one another.
7. The restraint system as recited in Claim 6, wherein said rail
connecting component is adapted to be rigidly connected to
said rail element and also rigidly connected to said upwardly
extending restraint portion, so that said upwardly extending
restraint portion is able to be fixed in an upwardly extending
restraint position.

8. The restraint system as recited in system 7, wherein said adjustable portion is arranged to be fixedly connected to the rail engaging portion so that a location of the vertically adjustable upper connecting portion of the adjustable portion can be fixed, said second restraint section having a first connection portion that connects to the upper connecting portion of the adjustable portion in a manner that its angular location in a horizontal plane can be changed.
9. The system as recited in Claim 8, wherein said second restraint section has a second connection to said cage connecting component that permits change of angular position of said second restraint section relative to said connecting component.
10. The system as recited in Claim 9, wherein said second restraint section has first and second connecting locations, said second restraint section being arranged so that a distance between said first and second connecting locations can be changed.
11. The restraint system as recited in Claim 1, wherein at least one of said rail engaging component and said cage engaging component comprises a positioning component having two spaced surface portions that are arranged to engage spaced contact locations of one said rail element or said cage element, and a clamping component to engage said one of

the rail element or the cage element in the clamping position, a fastener to engage said positioning component and said clamping component to press said clamping component into clamping engagement in the clamping position.

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12. The restraint system as recited in Claim 11, wherein said one of said rail engaging component and said cage engaging component comprises an elongate element having a right angle configurations where there are two flanges at right angles to one another, said positioning component having first and second positioning portions having a right angle configuration and are arranged to engage the surfaces of the right angle element that have an outside angle of about 145 degrees with respect to one another.

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13. The restraint system as recited in Claim 12, wherein said clamping component has two clamping portions connected to one another at a right angle, and having a configuration to engage surfaces of said right angle element that make an angle between each other of about 90 degrees.

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14. The restraint system as recited in Claim 11, wherein said positioning component and said clamping component are arranged to engage an elongate element having three outer surface contact locations, said positioning component comprising two positioning portions which join each other at an angle other than a straight angle, and having adjacent

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surfaces of less the 180 degree angle and which have two contact locations, said clamping member having a contact surface portion that is positioned to engage said third contact location of the elongate element and press the elongate element into a clamping engagement so as to be clamped between the two contact surface portions of the positioning member and the contact surface portion of the clamping member.

10 15. The restraint system as recited in Claim 14, wherein said clamping component has a first connecting location which is mechanically connected to said positioning element, and a second connecting location where a fastener engages said clamping element and said positioning element, said fastener
15 being arranged to exert a force on said clamping element to move the clamping element into clamping engagement.

20 16. The restraint system as recited in Claim 15, wherein said clamping component further comprises an adjustable clamping contact member being capable of connecting to said clamping component at different clamping locations so as to accommodate elongate elements of different sizes.